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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/654,174	09/03/2003	Ralph Romero	SL1217	4343

7590

07/28/2005

BP America Inc.
Docket Clerk
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EXAMINER

DIAMOND, ALAN D

ART UNIT

PAPER NUMBER

1753

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/654,174

Applicant(s)

ROMERO ET AL.

Examiner

Alan Diamond

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

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DETAILED ACTION

Drawings

1. The drawings are objected to because the crossed-out material near each data point in the figure should be removed from the figure. Furthermore, the hand written material in the figure is difficult to read. Additionally, the figure should be labeled "Figure 1" so as to be consistent with the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 is indefinite because the term "using" does not clearly set forth the course of the method. The meets and bounds for the claim cannot be determined. It is not clear what happens in the method. The same applies to dependent claims 14-20.

Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 8, 9, and 13-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lampkin et al (U.S. Patent 4,307,681).

With respect to claims 8 and 13, Lampkin teaches the preparation of a thin film solar cell comprising a glass substrate; a hard, highly scratch resistant tin oxide

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conductive transparent layer on the substrate, wherein said tin oxide layer reads on the instant CTO; a heterojunction photovoltaic element on the tin oxide layer; and a conductive layer (rear electrode) on the photovoltaic element (see col. 13, line 28 through col. 15, line 43; and Figures 2 and 3). Lampkin et al's device is "thin film" as in claim 8, particularly in view of the thickness of the tin oxide layer (see Table I at col. 13).

With respect to claims 8 and 13-18, Lampkin et al teaches that tin oxide films formed at a temperature of above about 475°C have a preferred hardness so as to form the hard, scratch resistant tin oxide film solar cell (see col. 13, lines 42-63). An exemplified thickness of the tin oxide film is 3000 to 6000 angstroms (i.e., 0.3 to 0.6 microns) (see Table I at col. 13). It is the Examiner's position that Lampkin et al's tin oxide films, prepared at col. 12, line 11 through col. 13, line 44 inherently have the instant hardness of at least about 200 Number of Taber passes, or at least about 300 Number of Taber passes, or at least about 400 Number of Taber passes, or at least about 500 Number of Taber passes, or at least about 600 Number of Taber passes, or at least about 700 Number of Taber passes, measured when using a CTO layer that is 6000 angstroms thick. This is particularly so in view of the fact that tin oxide is the same material as here claimed (see claim 10), and in view of the fact that Lampkin et al specifically calls its tin oxide film hard and scratch resistant.

With respect to claim 9, Lampkin teaches plural interconnected cells on the glass substrate, and a skilled artisan would consider this to be a photovoltaic module (see col. 15, lines 38-43).

With respect to claim 19, and as noted above, Lampkin et al's tin oxide layer reads on the instant CTO.

With respect to claim 20, an exemplified thickness of Lampkin et al's tin oxide film is 3000 to 6000 angstroms (i.e., 0.3 to 0.6 microns) (see Table I at col. 13).

Since Lampkin et al teaches the limitations of the instant claims other than the difference which is discussed below.

In addition, the instant CTO layer having a hardness as here claimed would obviously have been present once Lampkin et al's solar cell having the tin oxide layer is provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

7. Claims 1-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 11-298018 (herein referred to as JP '018).

With respect to claims 1, 10, 12, 13, and 20, JP '018 prepares a photovoltaic device comprising glass substrate (1), i.e., instant first substrate; transparent conductive tin oxide film (2) (i.e., instant CTO), photovoltaic elements (3) on the tin oxide film (2), rear electrode (4); and second substrate (5,6) (see Figure 1; and paragraphs 0015-0018). The tin oxide has a film thickness of about 6000 angstroms or less (paragraph 0012), and JP '018 exemplifies thicknesses of 5000 angstrom and 6000 angstrom (see Table 2).

With respect to claims 1-6 and 13-18, JP '018's tin oxide film (2) strengthens the substrate (1), e.g. reinforces it, and it is the Examiner's position that the tin oxide films prepared at paragraphs 0020 to 0027 and 0041 inherently have the instant hardness of at least about 200 Number of Taber passes, or at least about 300 Number of Taber passes, or at least about 400 Number of Taber passes, or at least about 500 Number of Taber passes, or at least about 600 Number of Taber passes, or at least about 700 Number of Taber passes, measured when using a CTO layer that is 6000 angstroms thick. This is particularly so in view of the fact that tin oxide is the same material as here claimed and JP '018's tin oxide strengthens the substrate.

With respect to claims 7 and 9, the device seen in JP '018's Figure 1 is a photovoltaic module.

With respect to claim 8, JP '018's device is thin film in view of the thicknesses used (see paragraphs 0004 and 0035).

With respect to claim 11, JP '018's device comprises amorphous silicon (see paragraph 0017).

Since JP '018 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

In addition, the instant CTO layer having a hardness as here claimed would obviously have been present once JP '018's photovoltaic device having the tin oxide layer is provided. Note In re Best, 195 USPQ at 433, footnote 4 (CCPA 1977) as to the providing of this rejection under 35 USC 103 in addition to the rejection made above under 35 USC 102.

Claim Rejections - 35 USC § 103

8. Claims 1-7 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lampkin et al (U.S. Patent 4,307,681) in view of JP 9-116180 (herein referred to as JP '180).

With respect to claim 1, Lampkin teaches the preparation of a solar cell comprising a glass substrate (i.e., instant first substrate); a hard, highly scratch resistant tin oxide conductive transparent layer on the substrate, wherein said tin oxide layer reads on the instant CTO; a heterojunction photovoltaic element on the tin oxide layer; and a conductive layer (rear electrode) on the photovoltaic element (see col. 13, line 28 through col. 15, line 43; and Figures 2 and 3).

With respect to claims 1-6, Lampkin et al teaches that tin oxide films formed at a temperature of above about 475°C have a preferred hardness so as to form the hard, scratch resistant tin oxide film for the solar cell (see col. 13, lines 42-63). An exemplified thickness of the tin oxide film is 3000 to 6000 angstroms (i.e., 0.3 to 0.6 microns) (see Table I at col. 13). It is the Examiner's position that Lampkin et al's tin oxide films, prepared at col. 12, line 11 through col. 13, line 44 inherently have the instant hardness of at least about 200 Number of Taber passes, or at least about 300 Number of Taber passes, or at least about 400 Number of Taber passes, or at least about 500 Number of Taber passes, or at least about 600 Number of Taber passes, or at least about 700 Number of Taber passes, measured when using a CTO layer that is 6000 angstroms thick. This is particularly so in view of the fact that tin oxide is the

same material as here claimed (see claim 10), and in view of the fact that Lampkin et al specifically calls its tin oxide film hard and scratch resistant.

With respect to claim 7, Lampkin teaches plural interconnected cells on the glass substrate, and a skilled artisan would consider this to be a photovoltaic module (see col. 15, lines 38-43).

With respect to claim 10, and as noted above, Lampkin et al's tin oxide layer reads on the instant CTO.

With respect to claim 12, an exemplified thickness of Lampkin et al's tin oxide film is 3000 to 6000 angstroms (i.e., 0.3 to 0.6 microns) (see Table I at col. 13).

Lampkin et al teaches the limitations of the instant claims other than the differences which are discussed below.

Lampkin et al does not specifically teach the use of a second substrate, as in instant claim 1. JP '180 teaches a solar battery module comprising glass substrate (12); transparent electrode, e.g., tin oxide layer (14); a semiconductor layer (16); a rear electrode (18); and a rear covering comprising thermosetting resin (22) and glass matt (24) (see Figure 1; and paragraphs 0012 to 0017). The rear covering provides the advantage of weather and moisture resistance (see paragraphs 0001, 0031 and 0032). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Lampkin et al's solar cell device, e.g., plural interconnected cells on the glass substrate with the rear covering of JP '180 (i.e., with a second substrate as here claimed) because JP '180's rear covering provides the advantage of weather and moisture resistance.

With respect to claim 11, Lampkin et al does not specifically teach that its semiconductor material can comprise amorphous silicon. Lampkin et al does teach semiconductor material such as CdS, ZnS, CdZnS can be used (see col. 14, lines 5-16). However, Lampkin et al is not limited to any particular semiconductor material (see col. 2, lines 11-18). JP '180 teaches the interchangeability of the use an amorphous silicon system and CdS system as the semiconductor material for a solar cell (see paragraph 0015). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an amorphous silicon system in place of a CdS system for the semiconductor material in Lampkin et al's solar cell because the substitution of art recognized equivalents, as shown by JP '180 would have been within the level of ordinary skill in the art.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

A handwritten signature in black ink, appearing to read 'Alan Diamond', with a long horizontal stroke extending to the right.

Alan Diamond
July 26, 2005